

CLAIMS

I claim:

5 Add
a. 1. A refrigeration system comprising;
a compressor delivering refrigerant under pressure;
a refrigerant condenser wherein heat (energy)
contained within the refrigerant is rejected to the
ambient;
a first refrigerant conduit providing for
10 refrigerant flow from the high pressure (output) side of
the refrigerant compressor to the refrigerant condenser;
a heat exchanger, being a vessel constructed with
internal tubing mounted vertically in a straight or
coiled configuration within a vertically oriented outer
vessel allowing for controlled transfer of heat in an
area of interface situated between the first to second
refrigerant conduit and the sixth to seventh refrigerant
conduit, which heat exchanger is constructed to allow
such vertical installation such that inlets for both high
15 pressure and low pressure conduits (second and seventh,
respectively are at the bottom of said heat exchanger and
that outlets for said high pressure and low pressure
conduits (third and eighth, respectively) are at the top
of said heat exchanger and that the flow of refrigerant
for both high pressure and low pressure conduits is
ascending;
a second refrigerant conduit proving for refrigerant
flow from the refrigerant condenser to the bottom
inlet of the refrigerant heat exchanger;
30 a refrigerant receiver being a vessel for the
accumulation of warm liquid refrigerant under high
pressure;
a third refrigerant conduit providing for
refrigerant flow from the top output of the refrigerant
35 heat exchanger to the refrigerant receiver;
an evaporator with a expansion valve or vented at its
inlet to initiate vaporization of the refrigerant;

a thermal expansion valve serving a throttling means to control the flow of refrigerant into the evaporator;

5 a fourth refrigerant conduit providing for refrigerant flow from the refrigerant receiver to the refrigerant thermal expansion device;

10 a fifth refrigerant conduit providing for refrigerant flow from the refrigerant thermal expansion device to the high pressure (inlet) side of the refrigerant evaporator;

a suction accumulator being a vessel for accumulating low pressure gaseous refrigerant; a sixth refrigerant conduit providing for refrigerant flow from the low pressure (output) side of the evaporator to the suction accumulator;

a seventh refrigerant conduit proving for refrigerant flow from the suction accumulator to the bottom inlet to the suction heat exchanger; and

an eighth refrigerant conduit proving for refrigerant flow from the top output of the suction heat exchanger to the low pressure (inlet) side of the compressor;

25 wherein a heat exchange device is located in heat exchange relationship with the refrigerant flow in the conduit from the seventh to eighth refrigerant conduit, constructed to cause a vertical flow and heat exchange of said internal conduit in parallel flow with the second refrigerant conduit providing for inverted parallel flow cross piping.

30 2. The refrigerant system set forth in Claim 1, further comprising a suction accumulator containing coiling such that refrigerant flow of the too the refrigerant conduit is placed in a secondary heat exchange relationship to the refrigerant flow of the
35 sixth refrigerant conduit within the said suction accumulator, wherein the design allows installation of a

suction accumulator with or without high pressure liquid coil within the too fourth refrigerant conduit.

5 3. The refrigerant system set forth in Claim 1, further comprising a by-pass of a suction accumulator such that the refrigerant flow of tire sixth refrigerant conduit from the evaporator flows directly to the heat exchanger wherein the design allows operation without any
10 suction accumulator, said function being sewed within the heat exchanger installed in the proposed manner.

15 4. The refrigerant systems set forth in Claims 1, 2 and 3 further comprising use of any manner of condenser (air, water or evaporative) and any manner of evaporator (for cooling or freezing) as no claim is made to such
20 arts but claim is made of systems incorporating such arts in the subject designs.

25 5. The refrigerant systems set forth in Claims 1, 2 and 3 further comprising creation of the parallel flea of refrigerants from the receiver to the evaporator and from the evaporator to the compressor in a vertical environment for heat exchange in a manner providing for
30 accumulation of liquid present in the low pressure refrigerant conduit obviating any need for further collection of liquid before or within the compressor.

35 6. The refrigerant systems set forth in Claims 1, 2 and 3 further comprising a secondary conduit for drawing Warm liquid for defrost or harvest directly from the receiver rather than using hot gas from compressor discharge without sacrificing integrity of the proposed design for operating a refrigerating system requires hot gas harvest or defrost.